

### **REMARKS**

Claims 1-20 are now pending in the application. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

### **REJECTION UNDER 35 U.S.C. § 103**

Claims 1-3, 7, 8, 10-13 and 19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Zumeris (U.S. Pat. No. 5696421) in view of Vishnevsky (U.S. Pat. No. 4,453,103) and combined with Miyazawa. This rejection is respectfully traversed.

The claimed invention defined in original claim 1 is directed to an operating apparatus 1. The operating apparatus 1 of the claimed invention includes: a driven element 5; a frame 4 which rotatably supports the driven element 5; a contacted element 51 which is stationary with respect to the frame 4; and a vibrating element 6 which includes a first piezoelectric element 62 that undergoes extension and contraction by application of an AC voltage, a reinforcing plate 63 having a contact portion 66 and an arm portion 68, and a second piezoelectric element 64 that undergoes extension and contraction by application of an AC voltage, the first piezoelectric element 62, the reinforcing plate 63 and the second piezoelectric element 64 being laminated in this order, and the vibrating element 6 being fixedly mounted on the driven element 5 in a state where the contact portion 66 abuts on the contacted element 51. As such, the vibrating element 6 receives reaction force from the contacted element 51 when the vibrating element 6 vibrates so that the driven element 5 is rotated together with the

vibrating element 6 by the reaction force. Notably, the driven element 5 rotatably displaces around the shaft 52 together with the vibrating element 6 because the vibrating element 6 is fixed on the driven element 5.

According to the claimed invention, since an operating mechanism for the driven element 5 is constructed using an ultrasonic motor having a laminated structure (that is, the vibrating element 6), it is possible to make the entire operating apparatus smaller and thinner. Further, since the structure of the operating apparatus 1 of the claimed invention can be extremely simplified and such an operating apparatus 1 can be easily manufactured, there is an advantage in that the manufacturing costs thereof can be reduced.

In contrast to the foregoing, Zumeris discloses a multi-axis rotation device. Figs. 8 and 9 of Zumeris show an embodiment of the rotation units of the multi-axis rotation device. Applicant respectfully submits that the rotation units of the embodiment shown in FIGS 8 and 9 should be applied to the multi-axis rotation devices shown in Fig. 1 instead of the ceramic motor 40, the bearing unit 42 and the like shown in Fig. 3. In view of such a configuration of the rotation units, when two motor units 106, 106 are activated to rotate a bearing 100 formed of inner and outer races 102 and 104, a friction changing unit 108 pushes the outer race 104 against a spherical element (not shown in Fig. 9) of the multi-axis rotation device, thereby increasing the friction between a support 115 and the spherical element. As such, the bearing 100, that is, the inner and outer races 102 and 104 are rotated with respect to the friction changing unit 108, while two piezoelectric motors 109, 109 of the motor unit 106 are stationary with respect to a support 114 (and the friction changing unit 108). This operation of the multi-axis

formation device of the embodiment in Figs. 8 and 9 (relative to Fig. 1) is not disclosed clearly in Zumeris, but Applicant respectfully submits that the rotation units shown in Figs. 8 and 9 should be those to achieve the function of the multi-axis rotation device shown in Figs. 1 and 3 in spite of an absence of the particular explanation for such an operation. Therefore, in the device of Zumeris, the bearing 100 is rotated, while the piezoelectric motors 109, 109 are not rotated together with the bearing 100, in clear contrast to the operating apparatus of the claimed invention. Because the configuration of the device of Zumeris is obviously different from that of the claimed invention, Applicant respectfully submits that the present invention defined in the original claim 1 is patentable over Zumeris. Vishnevsky and Miyazawa fail to cure the deficiency of Zumeris. Therefore the present invention should be patentable over the prior art.

#### **ALLOWABLE SUBJECT MATTER**

Claims 4-6 and 9 stand objected to but were deemed allowable if rewritten in independent form. Applicant defers rewriting these claims until after the Examiner considers the foregoing.

Claims 14-18 and 20 are allowed.

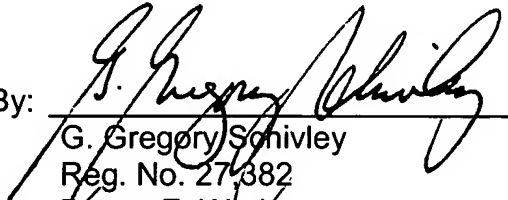
#### **CONCLUSION**

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office

Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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